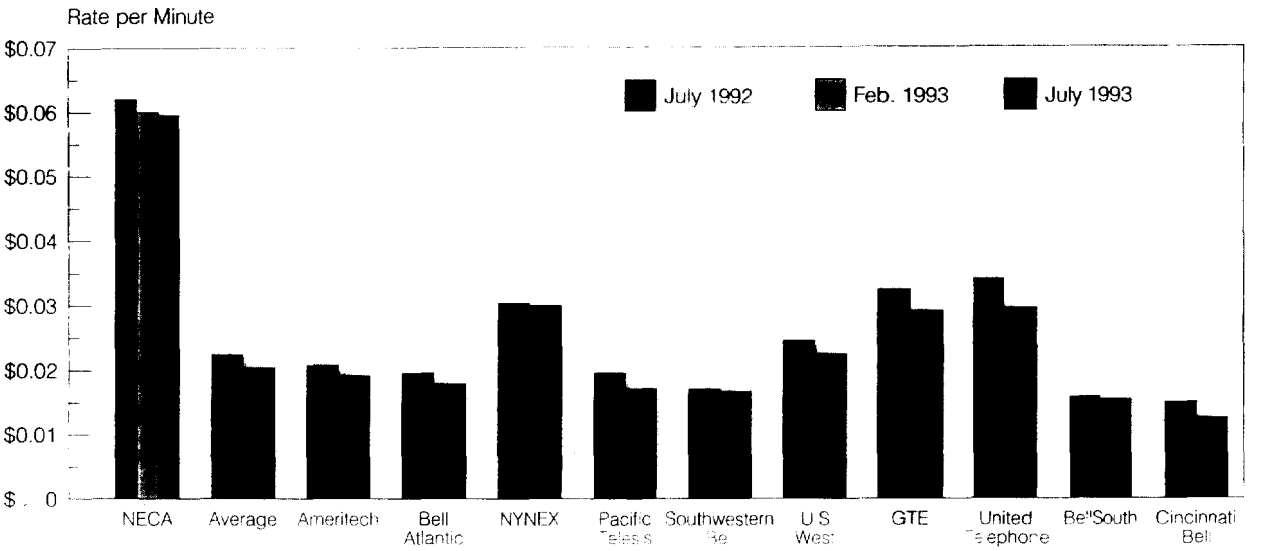
Figure 2.2

Traffic-Sensitive Switched Access

Total Premium Charges at 10 Miles*



*Includes Local Switching-2 + Information Surcharge + Local Transport Termination and Facility

Source: National Exchange Carrier Association (NECA) Rate Development Group, August 1993

Cost differences between small and large LECs are especially evident for the equipment used to provide inter- and intrastate TS-related services. Members of NECA's TS pool charge interstate switched access rates that are three times higher than the average rate for all other non-pooling LECs, including the BOCs. Figure 2.2 illustrates that the average 1993 interstate TS switching rate charged by NECA members was $0.06 per MOU versus an average industry rate of $0.02 per MOU. (See Chapter 3 for an explanation of NECA pooling and access charges.)

Two primary factors account for the difference in the interstate TS switched access rates of small and large LECs: density characteristics and the method used in the Federal Communications Commission's (FCC) Part 36 separations rules for the allocation of central office switching investment and related expense dollars.

The Density Factor

Again, NECA's study indicates that the average central office of its member LECs serves 1,275 subscriber access lines compared with 11,000 access lines for an average BOC central office. The density difference is further illustrated by the fact that NECA members serve approximately 5 percent of all access lines, yet operate 28 percent of the nation's central offices.[6] With higher densities and

[6]National Exchange Carrier Association, "Interstate Traffic-Sensitive Cost Recovery and Rate Disparity," June 1, 1992.

more large business subscribers, the BOCs average 30 percent more MOU per line than the average NECA pool member LEC and have 10 times the MOU per central office.

The difference in economies of scale is illustrated by Figure 2.3, which lists the switching investment per line for small and large LECs. The table shows that the amount of central office switching investment required for all large non-BOC LECs is $479 per line, or 30 percent greater than that for a BOC. A Tier 1 non-BOC LEC is a LEC with annual operating revenues in excess of $100 million, which is significantly larger than a typical small, rural LEC. As the size of the company decreases even further in terms of access lines served, the switching investment per line becomes even higher. NECA reports that the switching investment per line for a company with less than 10,000 access lines is $509 per line—38 percent higher than for the BOC average.[7]

Figure 2.3

Account 2210 Central Office Switching Investment

	BOCs	All Tier 1 Non-BOC LECs[1]
Account 2210 Investment	$39.5 billion	$11.3 billion
Number of Switched Access Lines	107,403,000	23,610,000
Switching Investment per Line	$368	$479

[1]A Tier 1 non-BOC LEC is a LEC with annual operating revenues in excess of $100 million.

Source: Federal Communications Commission, "Statistics of Communications Common Carriers," 1991/1992 edition.

When expressed in terms of interstate access MOU per access line, the usage per BOC access line is significantly greater than for the OPASTCO Study Group LECs. The study group LECs report a monthly average of 171 interstate access MOU per line based on 2.8 million access lines (see Figure 2.4). In 1991, the average BOC reported 200 monthly interstate access MOU per line, according to the FCC, a figure 17 percent higher than for the study group LECs. The difference is due in part to the BOCs' higher concentration of multi-line business subscribers.

The Separations Factor

The FCC's Part 36 separations rules—specifically the allocation of central office switching costs between the inter- and intrastate jurisdictions—are the second primary factor responsible for the large difference between the interstate TS switched access rates of small and large LECs.

Under the FCC's current Part 36 separations procedures, central office switching investment (FCC Part 32 accounts 2211, 2212, and 2215) is assigned to two categories: Category 2—Intertoll Switching (Tandem) and Category 3—Local Switching. The majority of the central office switching investment of the OPASTCO Study Group LECs is associated with Category 3. The allocation of local switching investment between the inter- and intrastate jurisdictions is determined by use of the **dial equipment minutes (DEM)** factor.

[7]Ibid.

Figure 2.4

OPASTCO Study Group LEC Statistics

State	Access Lines	Interstate Access Minutes of Use	Interstate Access Minutes per Line per Month	Interstate Originating Billed Minutes of Use
Alabama	80,883	144,895,711	149	62,965,210
Alaska[1]	289,513	968,692,895	279	380,990,451
Arizona	75,501	393,160,655	434	147,774,039
Arkansas	130,099	285,478,053	183	33,363,569
California	129,110	170,504,715	110	64,519,554
Colorado	22,680	50,679,412	186	29,367,369
Connecticut	NA	NA	NA	NA
Delaware	NA	NA	NA	NA
Florida	106,505	63,659,371	50	27,773,203
Georgia	149,802	182,972,136	102	81,163,605
Hawaii	NA	NA	NA	NA
Idaho	11,450	26,735,092	195	9,934,911
Illinois	NA	NA	NA	NA
Indiana	25,259	44,394,269	146	19,656,151
Iowa	10,938	25,206,587	192	12,370,071
Kansas	36,504	57,810,451	132	27,125,901
Kentucky	NA	NA	NA	NA
Louisiana	86,768	250,004,363	240	99,193,721
Maine	29,257	43,486,269	141	21,404,392
Maryland	NA	NA	NA	NA
Massachusetts	NA	NA	NA	NA
Michigan	140,289	265,810,630	158	98,481,358
Minnesota	47,828	123,485,057	215	46,735,157
Mississippi	31,668	68,352,697	180	31,493,535
Missouri	70,380	123,044,278	146	52,355,416
Montana	30,285	70,572,636	194	33,207,810
Nebraska	25,483	45,601,679	149	17,153,786
Nevada	32,679	112,267,738	286	50,106,712
New Hampshire	15,469	44,220,660	238	17,741,813
New Jersey	NA	NA	NA	NA
New Mexico	22,328	51,883,051	194	29,610,389
New York	103,543	181,268,323	146	85,515,806
North Carolina	272,761	265,756,545	81	123,427,816
North Dakota	12,836	22,343,708	145	10,401,031
Ohio	108,500	203,834,096	157	100,527,893
Oklahoma	58,617	97,640,136	139	45,637,280
Oregon	59,548	126,122,057	176	53,713,263
Pennsylvania	11,587	19,931,275	143	9,586,368
Rhode Island	NA	NA	NA	NA
South Carolina	101,123	180,591,133	149	79,060,853
South Dakota	13,730	23,042,510	140	10,588,545
Tennessee	72,423	174,084,702	200	68,815,103
Texas	122,797	168,386,127	114	64,540,172
Utah	12,071	21,585,985	149	10,267,015
Vermont	13,018	38,618,462	247	15,897,640
Virginia	3,550	6,548,815	154	2,252,383
Washington	46,867	140,132,555	249	52,775,933
West Virginia	18,411	46,430,261	210	18,208,080
Wisconsin	168,824	401,792,963	198	153,784,803
Wyoming	3,027	11,480,711	316	4,792,435
Total	2,803,911	5,748,508,042	171	2,304,280,542

[1]The Alaska access lines used in this study include the urban, as well as the rural, areas of the state

DEM is a usage based factor that is weighted to recognize that the cost per dial equipment minute is higher in smaller central offices than it is in larger central offices and that toll usage requires more equipment than local usage. LECs with fewer than 50,000 access lines apply a weighting factor to their interstate DEM which increases the interstate DEM factor and results in more local switching investment being allocated to the interstate jurisdiction. The weighting factor applied varies by number of access lines per study area—a LEC's operations within a state—as follows:

Access Lines in Service	Interstate DEM Weighting Factor
0 - 10,000	3.0
10,001 - 20,000	2.5
20,001 - 50,000	2.0
50,001 or higher	1.0

Through this weighting, the FCC has encouraged the deployment of digital switching and digital networks in rural America.

Under the FCC's rules, the amount of local switching investment allocated to the interstate jurisdiction through use of the interstate DEM is limited to 85 percent of a LEC's total local switching investment.

The FCC ordered LECs to begin a five-year phase-in of the use of the DEM factor beginning in 1988. 1993 marked the first year in which the DEM factor alone was used to jurisdictionalize local switching costs.

NECA estimates that the DEM weighting factor is responsible for approximately half of the difference, or about $0.02 per interstate MOU, between the local switching rates of small and large LECs.

Figure 2.5 shows the impact, by state, of weighted and unweighted DEM on the OPASTCO Study Group LECs' interstate local switching revenue requirements.[8] Again, the study group LECs serve 2.8 million access lines.

The first column shows an overall local switching revenue requirement of $0.0403 per MOU with a weighted DEM, which is close to the current NECA local switching rate of $0.0420 per MOU. But figures in the first column differ significantly from state to state, ranging from a low of $0.0156 per MOU in Tennessee to a high of $0.1492 per MOU in New Mexico.

The second column illustrates the interstate local switching cost per MOU with an unweighted DEM and shows an overall local switching revenue requirement of $0.0173 per MOU. This figure is approximately 56 percent greater that the Tier 1 LEC average rate of $0.0111 per MOU. When compared state by state, figures in the second column show that only a handful of states (including Tennessee, Virginia, West Virginia) have unweighted interstate local switching rates close to that of the BOCs. However, there are many states in which the OPASTCO Study Group LECs have unweighted rates significantly above the BOCs, such as Florida, Nebraska, and New Mexico.

[8]Calculated on a Part 36 separated basis.

Figure 2.5

Impact of Moving From an Interstate Weighted DEM to an Interstate Unweighted DEM for the OPASTCO Study Group LECs

State	Local Switching Revenue Requirement with Weighted DEM per MOU[1]	Local Switching Revenue Requirement with Unweighted DEM per MOU	Reduction to Local Switching Revenue Requirement per MOU
Alabama	$0.039894	$0.017529	$0.022365
Alaska	$0.033126	$0.016404	$0.016722
Arizona	$0.021593	$0.013316	$0.008277
Arkansas	$0.025787	$0.012223	$0.013564
California	$0.051128	$0.025071	$0.026057
Colorado	$0.074325	$0.024775	$0.049550
Connecticut	NA	NA	NA
Delaware	NA	NA	NA
Florida	$0.055806	$0.032593	$0.023213
Georgia	$0.044821	$0.018038	$0.026783
Hawaii	NA	NA	NA
Idaho	$0.088253	$0.029418	$0.058835
Illinois	NA	NA	NA
Indiana	$0.044962	$0.014987	$0.029975
Iowa	$0.063705	$0.021235	$0.042470
Kansas	$0.080748	$0.027978	$0.052770
Kentucky	NA	NA	NA
Louisiana	$0.029715	$0.011292	$0.018423
Maine	$0.065505	$0.021835	$0.043670
Maryland	NA	NA	NA
Massachusetts	NA	NA	NA
Michigan	$0.034990	$0.015444	$0.019546
Minnesota	$0.033101	$0.011660	$0.021441
Mississipp.	$0.036588	$0.013049	$0.023539
Missouri	$0.038828	$0.015173	$0.023655
Montana	$0.063098	$0.021033	$0.042065
Nebraska	$0.101346	$0.033782	$0.067564
Nevada	$0.072730	$0.026873	$0.045856
New Hampshire	$0.069950	$0.023317	$0.046633
New Jersey	NA	NA	NA
New Mexico	$0.149160	$0.049720	$0.099440
New York	$0.049401	$0.018657	$0.030744
North Carolina	$0.024567	$0.017932	$0.006635
North Dakota	$0.074182	$0.024727	$0.049455
Ohio	$0.015586	$0.013782	$0.001804
Oklahoma	$0.050285	$0.018236	$0.032049
Oregon	$0.061686	$0.021740	$0.039946
Pennsylvania	$0.066925	$0.022308	$0.044617
Rhode Island	NA	NA	NA
South Carolina	$0.032532	$0.014299	$0.018233
South Dakota	$0.091041	$0.030347	$0.060694
Tennessee	$0.015560	$0.007311	$0.008249
Texas	$0.078258	$0.028186	$0.050072
Utah	$0.080860	$0.026953	$0.053907
Vermont	$0.083289	$0.027763	$0.055526
Virginia	$0.029699	$0.009900	$0.019799
Washington	$0.053640	$0.018641	$0.034999
West Virginia	$0.027918	$0.010953	$0.016965
Wisconsin	$0.026028	$0.012951	$0.013077
Wyoming	$0.074912	$0.024971	$0.049941
Total	$0.040269	$0.017332	$0.022937

[1]minute of use (MOU)

Rural LECs Have Higher Loop-Related Investments

The large geographic and sparsely-populated service areas of the small, rural LECs drive loop-related costs much higher than those for the BOCs. **Loop costs** are the costs of the central office subscriber circuit equipment and the cable and wire facilities from the subscribers' premises to their serving central office. The cost of these facilities tends to be **non-traffic-sensitive (NTS)**, meaning costs do not differ with the amount of usage.

Loop **plant** consists of subscriber cable and wire facilities (FCC Part 32 accounts 2411 through 2441) and subscriber circuit and transmission equipment (account 2232). Under the FCC's Part 36 separations procedures, interstate loop costs are determined by using a 25 percent gross allocator. The remainder of a LEC's loop-related costs are recovered from the intrastate jurisdiction.

Use of the 25 percent interstate allocator was phased in over an eight-year period beginning in 1986. 1993 was the first full year during which LECs' loop-related costs were allocated to the interstate jurisdiction based on the 25 percent allocator.

Prior to 1993, loop costs were allocated to the inter- and intrastate jurisdictions based on the **subscriber plant factor (SPF)**. A basic component of the SPF was the usage-based **subscriber line usage (SLU)** factor, a compilation of all subscriber equipment minutes for all jurisdictions. The interstate SPF reflected a multiplier which increased the amount of loop costs allocated to the interstate jurisdiction.

To limit the amount of loop costs allocated to the interstate jurisdiction, the FCC in 1982 ordered LECs to freeze their interstate SPFs at the 1981 level and beginning in 1986, transition the frozen amounts either down or up to the 25 percent gross allocator over an eight-year period.

For many small LECs, the transition to the 25 percent allocator created a significant reduction in the amount of loop-related costs recovered from the interstate jurisdiction. The FCC, recognizing the magnitude of loop costs being shifted from the interstate to the intrastate jurisdiction, established new funding mechanisms to compensate LECs for the decrease in their interstate settlements. These mechanisms included the federal **subscriber line charge (SLC)** and the **Universal Service Fund (USF)**.

The interstate portion of a NECA member's loop costs is represented in NECA's **common line (CL)** pool. These loop costs are recovered through the FCC's monthly SLCs of $3.50 for residential and single-line businesses and $6 for multi-line businesses, through the **carrier common line (CCL)** MOU access charges paid by IXCs, and through the **long-term support (LTS)** payments from LECs that have exited the CL pool.

NECA's annual USF filing with the FCC is one of the best sources of information for measuring total company unseparated loop-related costs—the costs before they are divided between the inter- and intrastate jurisdictions. The FCC rules require all cost companies, including the BOCs, to file USF-related cost and demand data annually with NECA. Each LEC's data is put through a USF algorithm to determine the company's total unseparated cost per loop, as well as a nationwide average cost per loop.

Figure 2.6

Comparison of Loop Costs for BOCs and Non-BOC LECs[1]

State	Non-BOC LECs[2]		BOCs		Percentage Difference in Cost per Loop
	USF Loops	USF Cost per Loop	USF Loops	USF Cost per Loop	
Alabama	335,793	$364.54	1,603,457	$248.56	46.7%
Alaska	317,261	$392.21	NA	NA	NA
Arizona	118,787	$458.00	1,954,897	$251.38	82.2%
Arkansas	317,032	$438.17	779,071	$283.44	54.6%
California	4,015,723	$311.55	14,479,124	$178.23	74.8%
Colorado	36,729	$410.07	2,050,666	$214.52	91.2%
Connecticut	NA	NA	1,826,231	$219.22	NA
Delaware	NA	NA	431,021	$200.12	NA
Florida	3,379,636	$282.67	4,871,502	$303.59	-6.9%
Georgia	502,380	$382.83	3,060,426	$293.28	30.5%
Hawaii	637,175	$220.89	NA	NA	NA
Idaho	120,693	$433.81	396,587	$231.86	87.1%
Illinois	1,060,689	$243.54	5,499,497	$150.20	62.1%
Indiana	1,002,230	$275.28	1,760,163	$211.81	30.0%
Iowa	310,918	$270.05	934,648	$145.88	85.1%
Kansas	202,136	$393.13	1,122,734	$233.01	68.7%
Kentucky	421,998	$302.99	1,146,326	$271.13	11.8%
Louisiana	128,483	$536.56	1,906,487	$296.91	80.7%
Maine	79,996	$349.30	577,274	$305.71	14.3%
Maryland	NA	NA	2,916,208	$202.68	NA
Massachusetts	914	$290.73	3,674,937	$205.96	41.2%
Michigan	741,837	$303.65	4,301,850	$216.89	40.1%
Minnesota	402,664	$284.45	1,874,572	$184.27	54.4%
Mississippi	44,324	$504.11	1,030,890	$333.28	51.3%
Missouri	613,108	$399.36	2,106,598	$176.77	125.9%
Montana	90,403	$422.91	331,241	$254.09	66.3%
Nebraska	370,795	$227.09	477,407	$176.74	28.5%
Nevada	578,306	$167.80	248,879	$247.61	-32.2%
New Hampshire	38,899	$341.72	509,062	$323.37	5.7%
New Jersey	158,961	$272.62	4,972,841	$191.17	42.6%
New Mexico	102,899	$518.03	646,748	$253.12	104.7%
New York	1,052,328	$251.55	9,873,763	$243.46	3.3%
North Carolina	1,620,345	$259.86	1,811,943	$301.22	-13.7%
North Dakota	55,551	$355.44	268,474	$239.23	48.6%
Ohio	1,402,001	$260.12	4,033,799	$201.25	29.3%
Oklahoma	263,138	$406.68	1,365,811	$238.94	70.2%
Oregon	578,929	$278.19	1,084,775	$229.20	21.4%
Pennsylvania	894,451	$244.45	5,360,954	$185.39	31.9%
Rhode Island	NA	NA	551,201	$203.81	NA
South Carolina	418,841	$302.24	1,161,667	$370.18	-18.4%
South Dakota	39,329	$364.05	273,514	$220.03	65.5%
Tennessee	359,619	$250.86	2,136,798	$255.11	-1.7%
Texas	2,009,353	$356.25	7,372,426	$232.48	53.2%
Utah	29,059	$424.87	803,918	$182.96	132.2%
Vermont	48,622	$370.69	278,676	$362.99	2.1%
Virginia	766,014	$290.12	2715595	$225.36	28.7%
Washington	861,774	$282.90	2028186	$190.39	48.6%
West Virginia	118,509	$429.70	703633	$339.03	26.7%
Wisconsin	712,615	$277.66	1829562	$196.36	41.4%
Wyoming	18,989	$472.61	227,636	$348.68	35.5%
Total/Average	27,380,236	$298.18	111,473,725	$222.47	34.0%

[1]Data is from the National Exchange Carrier Association's (NECA)1993 Universal Service Fund (USF) submission to the Federal Communications Commission, October 1, 1993.

[2]The non-Bell LEC data represents cost company data for NECA Subset 2 and 3 member LECs.

Figure 2.7

1992 Interstate Carrier Common Line (CCL) Rate per Minute of Use (MOU) for the OPASTCO Study Group LECs

State	CCL Revenue Requirement at 11.25% Rate of Return	Subscriber Line Charges	Interstate Revenue Requirement for Calculation of CCL Rate	CCL Originating and Terminating MOU	CCL Rate per MOU
Alabama	$8,265,224	$3,604,137	$4,661,087	144,895,711	$0.0322
Alaska	$37,809,291	$14,584,653	$23,224,638	968,692,895	$0.0240
Arizona	$11,955,167	$3,563,531	$8,391,636	393,160,655	$0.0213
Arkansas	$16,479,451	$6,241,989	$10,237,462	285,478,053	$0.0359
California	$18,006,875	$5,468,035	$12,538,840	170,504,715	$0.0735
Colorado	$3,330,623	$1,022,944	$2,307,679	50,679,412	$0.0455
Connecticut	NA	NA	NA	NA	NA
Delaware	NA	NA	NA	NA	NA
Florida	$12,917,679	$4,791,511	$8,126,168	63,659,377	$0.1277
Georgia	$16,521,578	$6,739,556	$9,782,022	182,972,138	$0.0535
Hawaii	NA	NA	NA	NA	NA
Idaho	$1,581,025	$508,148	$1,072,877	26,735,092	$0.0401
Illinois	NA	NA	NA	NA	NA
Indiana	$2,198,009	$1,092,062	$1,105,947	44,394,269	$0.0249
Iowa	$867,487	$487,891	$379,596	25,206,587	$0.0151
Kansas	$4,115,968	$1,594,318	$2,521,650	57,810,451	$0.0436
Kentucky	NA	NA	NA	NA	NA
Louisiana	$12,803,934	$3,969,767	$8,834,167	250,004,363	$0.0353
Maine	$3,070,351	$1,137,072	$1,933,279	49,486,069	$0.0391
Maryland	NA	NA	NA	NA	NA
Massachusetts	NA	NA	NA	NA	NA
Michigan	$12,532,219	$6,169,003	$6,363,216	265,810,630	$0.0239
Minnesota	$3,365,244	$2,108,862	$1,256,382	123,485,057	$0.0102
Mississippi	$4,482,962	$1,407,356	$3,075,606	68,352,657	$0.0450
Missouri	$7,965,954	$3,311,450	$4,654,504	123,044,278	$0.0378
Montana	$4,493,095	$1,364,966	$3,128,129	70,572,636	$0.0443
Nebraska	$3,022,753	$1,145,785	$1,876,968	45,601,675	$0.0412
Nevada	$4,710,500	$1,557,052	$3,153,448	112,267,735	$0.0281
New Hampshire	$2,127,265	$683,099	$1,444,166	44,220,360	$0.0327
New Jersey	NA	NA	NA	NA	NA
New Mexico	$6,884,603	$1,001,788	$5,882,815	51,883,051	$0.1134
New York	$8,042,797	$4,489,611	$3,553,186	181,268,323	$0.0196
North Carolina	$19,161,456	$10,133,496	$9,027,960	265,756,348	$0.0340
North Dakota	$1,913,435	$568,153	$1,345,282	22,343,708	$0.0602
Ohio	$7,488,964	$4,958,952	$2,530,012	203,834,096	$0.0124
Oklahoma	$8,540,361	$2,779,193	$5,761,168	97,640,136	$0.0590
Oregon	$5,947,765	$2,639,666	$3,308,099	126,122,057	$0.0262
Pennsylvania	$1,196,914	$497,658	$699,256	19,931,275	$0.0351
Rhode Island	NA	NA	NA	NA	NA
South Carolina	$8,259,999	$4,558,776	$3,701,223	180,591,133	$0.0205
South Dakota	$1,314,943	$601,963	$712,980	23,042,519	$0.0309
Tennessee	$5,836,062	$3,251,089	$2,584,973	174,084,702	$0.0148
Texas	$19,422,119	$5,441,620	$13,980,499	168,386,127	$0.0830
Utah	$1,572,486	$552,060	$1,020,426	21,585,985	$0.0473
Vermont	$2,681,336	$562,541	$2,118,795	38,618,462	$0.0549
Virginia	$331,663	$155,803	$175,860	6,548,815	$0.0269
Washington	$4,552,203	$2,085,401	$2,466,802	140,132,555	$0.0176
West Virginia	$3,267,634	$960,677	$2,306,957	46,430,261	$0.0497
Wisconsin	$10,105,906	$5,901,362	$4,204,544	401,792,963	$0.0105
Wyoming	$676,939	$142,689	$534,250	11,480,711	$0.0465
Total	$309,820,239	$123,835,685	$185,984,554	5,748,508,044	$0.0324

Figure 2.6 contains loop cost data NECA filed with the FCC on October 1, 1993, and which was used to calculate the USF payments made to LECs beginning on January 1, 1994.[9] To calculate these loop cost figures NECA used LEC financial and demand data for the year ending December 31, 1992.

The 27.4 million non-BOC (NECA **Subset** 2 and 3 LECs) loops in Figure 2.6 had an average total unseparated cost per loop of $298. Non-BOC LECs include members of **holding companies** such as ALLTEL, Century, GTE, and Rochester Telephone Corp., as well as all other **independent** LECs whose **settlements** are calculated on a cost basis. This $298 figure is $76 more per loop or 34 percent higher than the BOC unseparated cost per loop of $222.

State-by-state comparisons of average costs per loop vary widely for the non-BOC LECs, from a low of $168 per loop in Nevada to a high of $518 per loop in New Mexico. Nevada's loop costs are low mainly because they include the holding company Centel's Las Vegas properties. In fact, if all holding company properties were excluded from Figure 2.6, the average cost per loop for the remaining LECs would rise to $380, or 71 percent more than the average BOC cost per loop. These non-holding company independents, which NECA refers to as Subset 3 LECs, represent approximately 2.24 million loops as of December 31, 1992. A number of these LECs have unseparated loop costs exceeding $1,000 per loop.

Another indicator of high loop costs in rural service areas is the interstate CCL costs for the OPASTCO Study Group LECs. Figure 2.7 shows the interstate CCL costs per MOU for the study group LECs disaggregated by state. The group's average costs are approximately $0.0324 per **originating** and **terminating** MOU for CCL access.

Figure 2.8 compares the study group CCL costs with the July 1993 CCL rates for the BOCs by **regional holding company (RHC)**. The average interstate CCL costs for the study group's 2.8 million lines exceed the BOC CCL rates by 220 to 491 percent. The difference is even greater when the BOC figures are compared with the highest CCL costs in Figure 2.7, such as those in Florida and New Mexico, which exceed $0.10 per MOU. Also, the differences shown are the minimum differences because the BOC CCL rates include LTS contributions, while the study group rates do not.

Figure 2.8

Comparison of Interstate Carrier Common Line Rates per Minute of Use

	BOCs by Region	OPASTCO Study Group LECs	Percentage Difference
Ameritech	$0.0086	$0.0324	377%
Southwestern Bell	$0.0101	$0.0324	321%
NYNEX	$0.0082	$0.0324	395%
Bell Atlantic	$0.0088	$0.0324	368%
BellSouth	$0.0147	$0.0324	220%
U S West	$0.0070	$0.0324	463%
Pacific Telesis	$0.0066	$0.0324	491%

[9]National Exchange Carrier Association (NECA), Universal Service Fund filing with the Federal Communications Commission (FCC), October 1, 1993. Since NECA's filing, the FCC has capped 1994 USF compensation per CC Docket No. 80-286, released December 23, 1993. For purposes of this study, the figures in Figure 2.6 are still deemed to be representative.

Although the interstate CCL costs of the NECA CCL Study Group LECs and other members of NECA's CL pool exceed those of the BOCs, the LECs do not charge IXCs the rates listed in the last column of Figure 2.9. The FCC created the LTS mechanism, as part of its access charge rules, to maintain reasonable CCL access rates nationwide for high-cost LECs.

When NECA began administering the access charge pools in May 1984, participation in the CL pool was mandatory for all LECs, including the BOCs. In April 1989, the FCC allowed LECs to withdraw from the CL pool and file their own company-specific CCL access rates. The BOCs and several larger LECs chose to withdraw, leaving the CL pool composed of smaller, more high-cost LECs. Had these LECs been required to reflect a CCL rate based on their own costs, the CCL rate would have risen sharply.

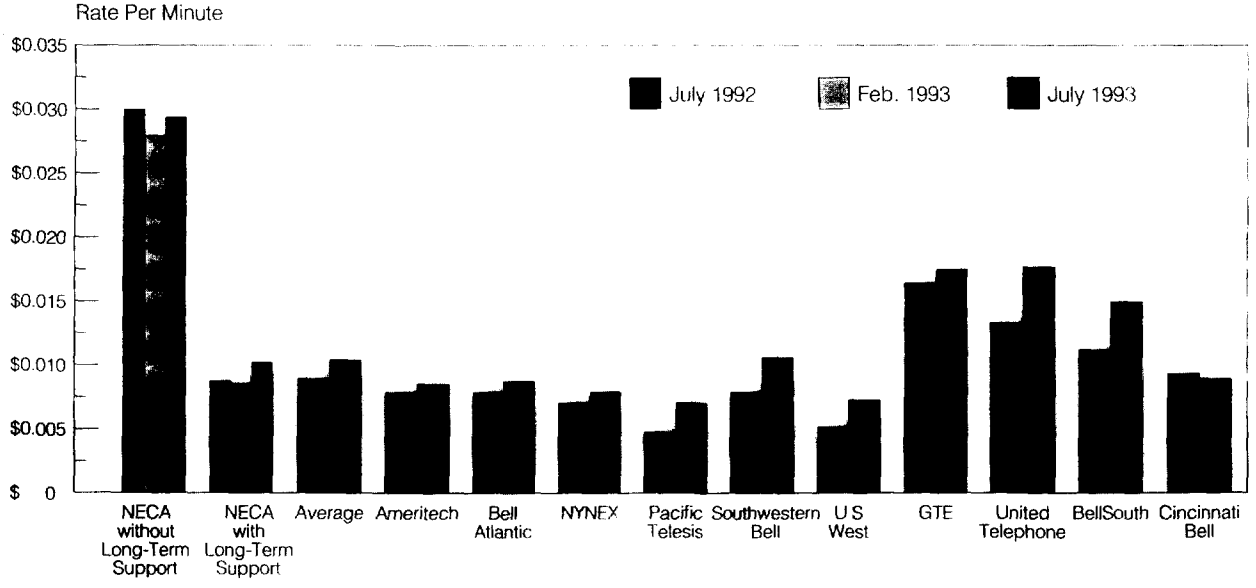
To maintain a reasonable CCL rate for the remaining NECA-pooling LECs, the FCC required all carriers that withdrew from the CL pool to continue to contribute to the pool as if they had never left. Exiting LECs that were "net contributors" to the CL pool—meaning the interstate access charges they submitted to NECA exceeded the settlements they received—have to pay LTS based on calculations made by NECA. LECs paying LTS include the cost of those payments in their own access charge rates.

As a result of the LTS mechanism, NECA CL pool members charge IXCs only $0.01 per originating and $0.011 per terminating CCL MOU—rates that are approximately $0.02 or 60 percent

Figure 2.9

Carrier Common Line (CCL) Access

Premium CCL Charges*

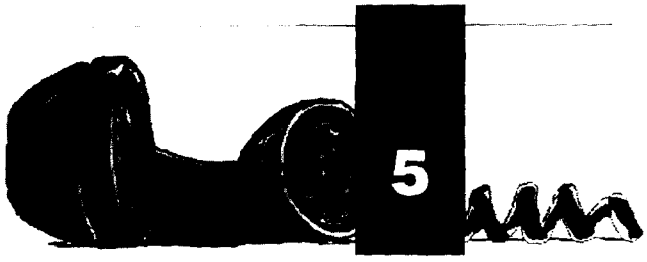


*The average of the originating and terminating rates

below the actual cost per CCL MOU. Figure 2.9 compares NECA's CCL rate—both with and without LTS—with the rates of larger LECs.

As illustrated throughout this chapter, the OPASTCO Study Group LECs must spend more, when measured on a per access line or per MOU basis, to serve their subscribers than larger LECs do. The study group LECs, on average, serve very large geographic areas with very low population densities. The amount of loop and switching investment required is much greater because longer loops are needed and calling volumes per required switching investment are lower.

If it were not for the LTS mechanism, small, rural LECs would be forced to charge CCL rates up to five times as great as those of the BOCs. If the weighted DEM support mechanism were to be eliminated, small, rural LECs still would have interstate local switching rates more than 50 percent greater than those of the BOCs. It is clear that small, rural LECs have characteristics that make it nearly impossible to provide service at rates as low as larger LECs without the benefit of the current support mechanisms.



Eliminating Current Support Mechanisms: The Impact on Rural Residents and Their Communities

Words appearing in **BOLD** are defined in Appendix A—Glossary

From the financial analysis in Chapter 4, it is clear that eliminating support mechanisms would increase rural subscribers' monthly local and long distance (**toll**) telephone bills. But these increases are only a small part of the larger social impact of increased telephone rates on subscribers and society. To fully understand the impact of higher rates, policy-makers also must examine how subscribers would react to such increases. According to the OPASTCO Subscriber Survey, telephone rate increases would cause reductions in telephone penetration, reductions in the purchase of other telecommunications services, reductions in spending on other non-communications products, and diminished family and community participation.

The OPASTCO Subscriber Survey

OPASTCO sent a seven-page[1] survey to 5,000 rural subscribers. The sample was obtained by randomly selecting 20 OPASTCO member **local exchange carriers (LECs)** from the membership list stratified by region and by **access line** size. Each selected LEC was then asked to generate a random sample of 250 subscribers—including both residential and business subscribers—within its service area and mail the survey to the sample with a cover letter. Subscribers responding returned the completed surveys directly to OPASTCO.

Of the 5,000 surveys mailed, 2,383 or 47.7 percent were returned to OPASTCO. Of these, 1,872 residential subscriber responses and 201 business subscriber responses were used for this study;[2] the remaining surveys were not included in the results due to missing data.[3]

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[1]The survey was a total of nine pages; however, because of the different sections for residential and business subscribers, each respondent needed to complete only seven pages.

[2]All OPASTCO Subscriber Survey figures in this chapter are based only on the 1,872 residential subscriber responses. The business subscriber responses are analyzed in Chapter 6.

[3]It was estimated that 1,000 returns would be needed to obtain a statistically valid sample. Assuming a response rate of 20 percent led to 5,000 surveys being sent out

The survey covered the communications services respondents subscribe to and use, the communications equipment they have, their community involvement, the use of the telephone in conjunction with community participation, and background socio economic and demographic information. (See Appendix D "OPASTCO Subscriber Survey Description" for additional details about the survey and the survey methodology.)

The survey section on communications services included questions about subscribers' perception of what they would do if the price of their telephone service—local and long distance—increased, as well as information about their use of the telephone, their use of other communications media, and their use of enhanced telecommunications services. To prevent scaring the subscribers into thinking their rates were increasing, and thus biasing their answers, questions about price decreases also were included in the survey.

The overwhelming response to the OPASTCO Subscriber Survey indicates that rural subscribers are concerned about the future of their telephone service and eager to have their voice heard by policy-makers.

Subscribers Disconnecting Their Telephone Service

The OPASTCO Subscriber Survey addressed the effect of rate increases by asking respondents how they perceived they would react if monthly charges for their basic local telephone service or for their long distance service were to increase by $5, $10, $15, and $25. Figure 5.1 summarizes the responses of those subscribers saying they would discontinue their telephone service completely in response to local service rate increases. The percentage of subscribers claiming they would disconnect their local telephone service ranges from 4.3 percent at a $5 monthly increase to 44.7 percent at a $25 monthly increase.[4]

Figure 5.1

OPASTCO Subscriber Survey Respondents Saying They Would Disconnect Service

Level of Monthly Price Increase	Number of Subscribers Disconnecting Service	Number of Subscribers Responding to Question	Percentage of Subscribers Disconnecting Service
$5	62	1,429	4.3%
$10	117	907	12.9%
$15	207	764	27.1%
$25	396	886	44.7%

As described in Chapter 4, this study found that the OPASTCO Study Group LECs' subscribers[5] could expect an average increase in their local service rates of $12.84 per month if cost sup-

[4]Statistically, missing responses may be treated either *below* or *above* the total line. The numbers in this study represent treatment of missing *below* the total line, i.e. missing is not included as a category of response. If missing is treated as *above* the line, the percentage of respondents reporting that they would disconnect are as follows: 3.3 percent at a $5 increase, 6.3 percent at a $10 increase, 11.1 percent at a $15 increase, and 21.2 percent at a $25 increase.

[5]The OPASTCO Study Group LECs' subscribers are the 2.8 million subscribers of the 424 LECs used in the cost analysis in Chapter 4.

Figure 5.2

Local Service Increases and Resulting Disconnections for the OPASTCO Study Group LECs' Subscribers

State	Access Lines (A)	Potential Increase to Local Service (B)	Percentage Who Said They Would Disconnect Service (C)	Total Access Line Impact (D)=(A)x(C)
Alabama	80,883	$11.48	12.9%	10,434
Alaska	289,513	$13.79	27.1%	78,458
Arizona	75,501	$9.64	12.9%	9,740
Arkansas	130,099	$11.96	12.9%	16,783
California	129,110	$28.13	44.7%	57,712
Colorado	22,680	$14.79	27.1%	6,146
Connecticut	NA	NA	NA	NA
Delaware	NA	NA	NA	NA
Florida	106,505	$13.55	27.1%	28,863
Georgia	149,802	$13.97	27.1%	40,596
Hawaii	NA	NA	NA	NA
Idaho	11,450	$22.86	44.7%	5,118
Illinois	NA	NA	NA	NA
Indiana	25,259	$8.5[illegible]	12.9%	3,258
Iowa	10,938	$10.4[illegible]	12.9%	1,411
Kansas	36,504	$14.5[illegible]	44.7%	16,317
Kentucky	NA	[illegible]	NA	NA
Louisiana	86,768	$22.[illegible]	44.7%	38,785
Maine	29,257	$14.[illegible]	27.1%	7,929
Maryland	NA	[illegible]	NA	NA
Massachusetts	NA	[illegible]	NA	NA
Michigan	140,289	$[illegible]	12.9%	18,097
Minnesota	47,828	$[illegible]	12.9%	6,170
Mississippi	31,668	$1[illegible]	27.1%	8,582
Missouri	70,380	$1[illegible]	12.9%	9,079
Montana	30,285	$1[illegible]	27.1%	8,207
Nebraska	25,483	$19.[illegible]	27.1%	6,906
Nevada	32,679	$[illegible]	27.1%	8,856
New Hampshire	15,469	$10.84	12.9%	1,996
New Jersey	NA	NA	NA	NA
New Mexico	22,328	$46.86	44.7%	9,981
New York	103,543	$9.82	12.9%	13,357
North Carolina	272,761	$4.87	4.3%	11,729
North Dakota	12,836	$24.23	44.7%	5,738
Ohio	108,500	$[illegible].57	4.3%	4,666
Oklahoma	58,617	$19.9[illegible]	27.1%	15,885
Oregon	59,548	$13.3[illegible]	27.1%	16,138
Pennsylvania	11,587	$1[illegible].8[illegible]	27.1%	3,140
Rhode Island	NA	NA	NA	NA
South Carolina	101,123	$6.43	4.3%	4,348
South Dakota	13,730	$16.35	27.1%	3,721
Tennessee	72,423	$6.[illegible]6	4.3%	3,114
Texas	122,797	$[illegible].39	44.7%	54,890
Utah	12,071	$16.53	27.1%	3,271
Vermont	13,018	$13.53	27.1%	3,528
Virginia	3,550	$12.89	27.1%	962
Washington	46,867	$12.84	27.1%	12,701
West Virginia	18,411	$23.81	44.7%	8,230
Wisconsin	168,824	$3.96	4.3%	7,259
Wyoming	3,027	$19.21	27.1%	820
Total/Average	2,803,911	$12.84	20.4%	572,921

ports were eliminated, although the potential increase varies significantly by state and individual LEC. Applying the disconnect percentages from the OPASTCO Subscriber Survey to the OPASTCO Study Group findings gives the potential number of study group subscribers who would disconnect their telephone service if cost support mechanisms were eliminated, causing local service rates to increase by the levels indicated in Chapter 4. Such calculations indicate that approximately 573,000 or 20.4 percent of the 2.8 million subscribers of the OPASTCO Study Group LECs would disconnect their local telephone service. Even if only half of the customers indicating they would disconnect service actually did so, that still would translate into approximately 287,000 study group subscribers disconnecting service.

Figure 5.2 lists these results by state.[6] Column B gives the dollar amount of the projected average local rate increase, Column C lists the OPASTCO Subscriber Survey percentage of subscribers who said they would disconnect service at that level of increase, and Column D shows the number of access lines that would thus disconnect if the increase were to occur.

Many OPASTCO Subscriber Survey respondents who say they would pay higher local service rates indicate they would fund such an increase by reducing the number and/or length of their long distance calls. This option would be seriously impeded, however, if toll rates were **deaveraged** and inter- and intrastate toll rates rose by as much as 91 percent and 70 percent respectively, as indicated by this study. (See Chapter 4 for details on the impact of deaveraging inter- and intrastate toll rates.)

Price Elasticities of Demand for Local Service

A useful tool in the economic analysis of potential rate increases is the measurement of price elasticity of demand. This term represents mathematically what consumers will do when faced with price changes. Measuring elasticity can help policy-makers understand how subscribers would respond to higher rates due to the elimination of cost support mechanisms and what effect that response would have on the future financial viability of small, rural LECs.

Elasticity is based on the law of demand, which states that as price increases, fewer products will be sold, and as price decreases, more products will be sold. If price increases and this generates more revenue, demand is said to be inelastic—while the higher price drives away some customers, enough customers remain paying the higher price to offset losses from those who drop the service. If price increases and this generates less revenue, demand is elastic—the number of customers dropping service is significant enough to offset any revenue from the price increase.

When the formula used to determine elasticity[7] yields a result greater than 1, this means demand is elastic. A yield of less than 1 means demand is inelastic.

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[6]Disconnects would be expected to vary by region, hence, application of a national disconnect estimate is only an approximation. Region-specific data was not used, however, due to the relatively small sample size in some regions.

[7]The formula for determining elasticity of demand is the percentage change in quantity divided by the percentage change in price. In this case, quantity is the number of subscribers. While elasticity of demand traditionally is a negative number, this study, for ease of description, treats the elasticity number as an absolute value.

Figure 5.3 illustrates the elasticities of demand for local telephone service as calculated from the OPASTCO Subscriber Survey results. At all price increase levels, demand for local service is inelastic, meaning that at each rate increase level, LECs would lose some subscribers, but the remaining subscribers paying the higher rates would generate enough revenue to offset the losses from the disconnections.

Figure 5.3

Elasticity of Demand for Basic Local Service

Level of Monthly Price Increase	Percentage of Subscribers Disconnecting Service	Margin of Error[1]	Price Elasticity of Demand
$5	4.3%	3%	-0.1265
$10	12.9%	3%	-0.1897
$15	27.1%	4%	-0.2631
$25	44.7%	3%	-0.2614

[1]The margin of error is expressed as a plus or minus of each percentage of customers who say they would terminate service. It varies at each price level because the number of responses varies for each question. The margin of error is at a 95 percent confidence level.

To determine the elasticity of demand, the percentage of subscribers saying they would terminate their local service was divided by the percentage change in price for local service. The percentage change was calculated for each individual respondent by adding the price increase to the monthly charge for local telephone service reported by the respondent and then summing across all respondents.

The calculations confirm that demand for local telephone service is inelastic, or insensitive to price change. Although elasticity increases as the price for local service climbs, it remains well below 1, even at a $25 increase.

Although demand for local service remains inelastic, the respondents' answers regarding how they would finance price increases in local service indicate that long distance calling, as well as other services, would be reduced. This suggests that revenue streams from other services, including long distance, would suffer, creating a situation in which prices would need to continue to increase, causing some percentage of subscribers to disconnect at each increasing price level. This is in addition to the fact that, according to Chapter 4, toll deaveraging also would increase toll prices. This eventually could lead to a situation in which the drop-off rate accelerates to a point where demand for local service becomes elastic—in other words, where a price increase leads to a revenue decrease. Also, LECs' ability to provide the new infrastructure necessary for expanding rural services would suffer from their decreased ability to fund such network development.

Alternatives to Disconnection

Service disconnection may be the most obvious and dramatic effect of increased telephone rates, but higher charges also affect those subscribers who decide to pay the higher price to continue service. A major goal of the OPASTCO Subscriber Survey was to determine what alternatives rural subscribers would take in lieu of service termination. Results suggest two major ways in which consumers would make up for local rate increases: reducing spending on toll service and reducing discre-

tionary spending. Each level of price increase in both local and toll rates triggers a different mix of subscriber reactions.[8]

If faced with a $5 increase in monthly local service rates, 4.3 percent of the OPASTCO Subscriber Survey respondents say they would disconnect their local telephone service, while 44.7 percent say they would finance the increase from their discretionary income, and 12.3 percent say they would finance it by spending less on toll calls (see Figure 5.4). However, if toll rates also increased as a result of deaveraging, subscribers would not be able to save enough on toll calls to make up for rate increases in both areas. In fact, based on respondents' report of their long distance bill (the median is $25 per month), 50 percent of subscribers would not be able to offset a local rate increase of $25 per month by completely eliminating toll calls. Ten percent of respondents would not be able to fund a $5 increase in local service by totally eliminating toll calls, and 25 percent would be unable to fund a $15 increase by eliminating all of their toll calls.

Figure 5.4

$5 Local Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	639	44.7%	639	44.7%
Reduce long distance use	176	12.3%	815	57.0%
Reduce spending on enhanced services	14	1.0%	829	58.0%
Reduce spending on other communications services	7	0.5%	836	58.5%
Reduce spending in non-communications areas	8	1.3%	854	59.8%
Discontinue telephone service completely	62	4.3%	916	64.1%
Other	59	4.1%	975	68.2%
Multiple responses	454	31.8%	1,429	100.0%

Frequency Missing = 443

If faced with a $10 increase in monthly local service rates, 12.9 percent of respondents say they would disconnect service, while most others indicate that they would make up for the increase by reducing toll calling. Once again, this would be a less effective option if rate deaveraging increased toll charges.

Figure 5.5

$10 Local Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	157	17.3%	157	17.3%
Reduce long distance use	336	37.0%	493	54.3%
Reduce spending on enhanced services	31	3.4%	524	57.7%
Reduce spending on other communications services	28	3.1%	552	60.8%
Reduce spending in non-communications areas	30	3.3%	582	64.1%
Discontinue telephone service completely	117	12.9%	699	77.0%
Other	24	2.6%	723	79.6%
Multiple responses	184	20.3%	907	99.9%[9]

Frequency Missing = 965

[8]Respondents were asked to check only one response per price increase, however, many checked multiple answers. Thus a "Multiple responses" category was added. Also, an adjustment was made to the "Discontinue telephone service completely" category responses. If a respondent checked only this response at the $5 increase, the implication is that the subscriber also would discontinue service at higher price increases. Thus, the "Discontinue telephone service completely" categories for the $10, $15, and $25 increases were adjusted to reflect this assumption.

[9]Cumulative percentages on some charts do not add up to 100 percent due to rounding.

At a $15 monthly increase, the number of customers who would disconnect their telephone service more than doubles to 27.1 percent. Once again, those who indicate that they would not disconnect service would make up the difference by reducing toll calling.

Figure 5.6

$15 Local Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	70	9.2%	70	9.2%
Reduce long distance use	195	25.5%	265	34.7%
Reduce spending on enhanced services	33	4.3%	298	39.0%
Reduce spending on other communications services	43	5.6%	341	44.6%
Reduce spending in non-communications areas	65	8.5%	406	53.1%
Discontinue telephone service completely	207	27.1%	613	80.2%
Other	32	4.2%	645	84.4%
Multiple responses	119	15.6%	764	100.0%

Frequency Missing = 1,108

When asked how they would react to a $25 local rate increase, 44.7 percent of survey respondents say they would disconnect their telephone service, while 17.8 percent would make up for the increase by reducing toll calling.

Figure 5.7

$25 Local Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	52	5.9%	52	5.9%
Reduce long distance use	158	17.8%	210	23.7%
Reduce spending on enhanced services	14	1.6%	224	25.3%
Reduce spending on other communications services	22	2.5%	246	27.8%
Reduce spending in non-communications areas	46	5.2%	292	33.0%
Discontinue telephone service completely	396	44.7%	688	77.7%
Other	68	7.7%	756	85.4%
Multiple responses	130	14.7%	886	100.1%

Frequency Missing = 986

The tables in Figure 5.8 show how respondents would react to increases of $5, $10, $15, and $25 in their long distance bills. Based on these and the preceding tables on reactions to local service rate increases, a strong relationship appears to exist between local and toll service when subscribers react to rate increases. A more detailed analysis of this cross-elasticity is warranted so policy-makers can determine how changing pricing policies in one area affects revenues and subscribers in both areas, particularly in rural America.

Figure 5.8

OPASTCO Subscriber Survey Respondents' Reaction to Long Distance Bill Increases

Table 1
$5 Long Distance Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	410	29.3%	410	29.3%
Reduce the number of calls	118	8.4%	528	37.7%
Reduce the length of calls	38	2.7%	566	40.4%
Reduce the number and length of calls	72	5.1%	638	45.5%
Make calls only when night/evening discounts are effective	41	2.9%	679	48.4%
Reduce subscription to enhanced services	4	0.3%	683	48.7%
Reduce spending on other communications services	5	0.4%	688	49.1%
Reduce spending in non-communications areas	11	0.8%	699	49.9%
Discontinue telephone service completely	32	2.3%	731	52.2%
Other	36	2.6%	767	54.8%
Multiple responses	632	45.2%	1,399	100.0%

Frequency Missing = 473

Table 2
$10 Long Distance Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	76	8.5%	76	8.5%
Reduce the number of calls	169	18.8%	245	27.3%
Reduce the length of calls	68	7.6%	313	34.9%
Reduce the number and length of calls	99	11.0%	412	45.9%
Make calls only when night/evening discounts are effective	55	6.1%	467	52.0%
Reduce subscription to enhanced services	4	0.4%	471	52.4%
Reduce spending on other communications services	5	0.6%	476	53.0%
Reduce spending in non-communications areas	11	1.2%	487	54.2%
Discontinue telephone service completely	60	6.7%	547	60.9%
Other	16	1.8%	563	62.7%
Multiple responses	336	37.4%	899	100.1%

Frequency Missing = 973

Table 3
$15 Long Distance Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	33	4.3%	33	4.3%
Reduce the number of calls	109	14.2%	142	18.5%
Reduce the length of calls	78	10.2%	220	28.7%
Reduce the number and length of calls	125	16.3%	345	45.0%
Make calls only when night/evening discounts are effective	54	7.0%	399	52.0%
Reduce subscription to enhanced services	8	1.0%	407	53.0%
Reduce spending on other communications services	6	0.8%	413	53.8%
Reduce spending in non-communications areas	15	2.0%	428	55.8%
Discontinue telephone service completely	100	13.1%	528	68.9%
Other	18	2.3%	546	71.2%
Multiple responses	220	28.7%	766	99.9%

Frequency Missing = 1,106

(continued)

Figure 5.8 *(continued)*

Table 4
$25 Long Distance Bill Increase

Subscriber Reaction	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Pay the increased amount	29	3.4%	29	3.4%
Reduce the number of calls	102	11.9%	131	15.3%
Reduce the length of calls	28	3.3%	159	18.6%
Reduce the number and length of calls	132	15.4%	291	34.0%
Make calls only when night/evening discounts are effective	49	5.7%	340	39.7%
Reduce subscription to enhanced services	2	0.2%	342	39.9%
Reduce spending on other communications services	2	0.2%	344	40.1%
Reduce spending in non-communications areas	17	2.0%	361	42.1%
Discontinue telephone service completely	202	23.6%	563	65.7%
Other	36	4.2%	599	69.9%
Multiple responses	257	30.0%	856	99.9%

Frequency Missing = 1,016

Socio-Economic Factors

Rural subscribers' reactions to both local and toll rate increases vary according to their lifestyle,[10] age, and household size. Several conclusions drawn from analyzing these variables are presented below. Specific details on the results of the contingency analyses for each variable, in table format, are included in Appendix E.

Generally, the OPASTCO Subscriber Survey results show that low income and elderly subscribers would not be the only groups significantly affected by the rate increases brought by eliminating support mechanisms and deaveraging toll rates. Depending on the size of the rate increase, a broad spectrum of age groups and lifestyle categories would face disconnection or tough spending choices. It is clear that even at a $5 increase, subscribers perceive that they would have to reduce their telephone services, and as rates increase, a greater number of subscribers report they would be affected.

Local Rate Increases

Analysis of subscribers' reactions to local rate increases according to lifestyle category shows that starting-out singles are the least likely to simply pay a $5 increase, while young couples with no children are the most likely to simply pay the increase. Responding by simply paying the increase drops off dramatically at $10 in all lifestyle categories and continues to decline at each rate increase level.

[10]For the OPASTCO Subscriber Survey, lifestyle was measured using a modified version of the Nielson Station Index, which takes into account the presence of children, the age of the householders, and their marital status as these elements combine to predict media use. The following lifestyle categories were used in this analysis: families with children age 10 and under; families with teenagers age 18 and younger; starting-out singles who never have been married and have no children present; young couples who are married with no children and the oldest household member is 54 or younger; mature singles who are either over 35 and never married or between 18 and 54 and divorced or separated with no children; empty nesters who are married with no children at home and the oldest household member is between ages 55 and 64; and seniors who are age 65 and over.

When considering age alone, young people show the least willingness to pay the increase, while subscribers ages 35 to 54 are most likely to pay the increase, particularly if the increase is $10 or more.

The analysis of the impact of rate increases by lifestyle category and age group suggests there should be particular concern about the impact of increased telephone rates on young people. This group rarely is adequately represented in the policy arena and is even more unlikely to be included in income redistribution programs to protect access to telephone service. In fact, penetration of telephone service in households where the householder is under age 25 is significantly lower than other age groups.[11] Yet these young people represent the future of the United States. On the basis of the OPASTCO Subscriber Survey analysis, it appears that increasing telephone rates would reduce access to the information superhighway for young subscribers. One of the major problems of rural America today is the out-migration of young people to urban areas where they can obtain better employment. Hence, the finding that young rural subscribers are most likely to reduce telephone spending is even more alarming for rural areas than it is on a national basis.

As previously indicated, long distance service is the most likely area for consumers to reduce spending to compensate for an increase to their local rates. It is in the area of long distance use that seniors would choose to reduce spending first. Families with children show the highest rate of reductions in long distance use in response to a rate increase. A look at the age groups indicates that subscribers age 65 and over also show the most dramatic reduction in long distance use in response to a $5 local rate increase.

It is difficult to conclude how spending on enhanced services and other communications services (*e.g.* cable television) would be affected by local rate increases because a majority of the OPASTCO Subscriber Survey respondents do not subscribe to such services. But a number of those who do subscribe say they are willing to reduce use of these services to make up for local service rate increases.

Subscribers ages 35 to 54 are most likely to reduce their use of enhanced and other communications services to compensate for any level of rate increase for local service. However, the monthly charge rural subscribers generally pay for custom calling features (a median of $2 per month according to the OPASTCO Subscriber Survey data) would be too small to compensate for increased local rates resulting from the elimination of support mechanisms. Discontinuing or reducing subscription to enhanced services to pay for local service rate increases is counter to the current national policy of encouraging network development to provide consumers' access to advanced services.

Empty nesters and mature singles are the lifestyle categories most likely to reduce spending on non-communications products and services to offset a price increase in local service. From an age standpoint, seniors are the group most likely to reduce spending in non-communications areas if local service rates increase by $5, while at $10 and $15 increases, those ages 19 to 24 are most likely to make such reductions.

It is clear that a significant number of subscribers would cut expenses in more than one area to compensate for a rate increase (as shown by the "Multiple responses" category), even at $5. This

[11] Alex Belinfante, "Telephone Subscribership In the United States," Federal Communications Commission, July 1993.

means that even a small telephone rate increase could alter consumer spending outside the communications market.

Empty nesters are the lifestyle category most likely to disconnect service because of a $5 or $10 increase. At $25, starting-out singles show the highest percentage of disconnection responses, while seniors show the second highest percentage.[12] The age category most likely to disconnect also varies with the size of the local service rate increase. Subscribers ages 45 to 54 are most likely to disconnect at a $5 increase, while subscribers age 65 and over are the second most likely.[13] These groups, along with those ages 55 to 64, are more likely to disconnect at a $10 increase than younger age groups, while at a $25 increase, disconnect responses among subscribers ages 25 to 30 increase dramatically.

When evaluating subscriber reactions to local service rate increases according to household size, households with three or more members are less likely to disconnect service than other size households at rate increases of $5 and $10.[14] Households with three to four members are most likely to simply pay the increase at $5, while at increases of $10 or more, households with more than four members are increasingly less willing to pay the increase than smaller households.[15]

Four- and six-member households stand out with respect to their willingness to reduce long distance services to compensate for local rate increases at the $10 level.[16] At the $15 and $25 increase levels, the tendency for households of six or more members to reduce long distance is much stronger than it is among households where there are fewer members. These larger households also are likely to take multiple actions when faced with a $5 local price increase. Households with five members are most likely to reduce enhanced services at a $5 increase.[17]

Based on these results, it generally appears that the impact of increased local rates would be greater for larger households. They first would reduce spending across several other services and then make additional spending adjustments by further reducing long distance services as the increase in local rates rises.

Age, household size, lifestyle category, and income are related to each other. Hence, in order to better understand the most important impacts with respect to price increases, a regression analysis

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[12]If missing responses are treated *above* the line, however, seniors show the lowest percentage of disconnection responses. Also, while starting-out singles show a high propensity to disconnect at $5, the number of respondents is small. Thus this result should be viewed with caution.

[13]If missing responses are treated *above* the line, subscribers age 65 and over are the most likely to disconnect. Also, the age 18 and under age group shows the highest percentage of disconnects at a $5 local increase, however, there are very few subscribers in that age group who responded to the survey, so it is not possible to conclude that this percentage is indicative of an actual propensity for the age group to disconnect.

[14]The number of respondents in households with more than five members is small. In particular, households with seven or eight members constitute only a few responses. Hence, although the tendency appears to hold, with the exception of eight-member households, generalization beyond five members should be viewed with caution.

[15]While households with seven members also appear somewhat higher than other size households, there are only seven respondents in this category, which is too few from which to draw a conclusion.

[16]However, the large number of missing responses for six-member households causes the percentage for this group to change dramatically when missing responses are treated *above* the line.

[17]Although eight-member households show the highest percentage, the smaller number of responses makes it impossible to draw any conclusions about their general tendency to reduce enhanced services.

of these variables on the possible subscriber response choices set out in the price increase questions was performed. The type of regression and the resulting tables are outlined in Appendix D. (Lifestyle category was dropped from the analysis because of its collinearity with age.)

The analysis indicates that subscribers with lower income levels are more likely to reduce long distance use and cut expenses across the board at a $5 local service rate increase. Household size is an additional significant factor in the decision to reduce enhanced services at this rate increase level. At a $10 increase, age plays a role in addition to income in the decision to discontinue service completely, while both income and household size are significant factors for selecting many of the other options. At a $15 increase, income is the only factor that shows significance. When the increase is $25, income is a significant factor in every possible decision; household size also has an impact for several options other than disconnection.

According to the cost analysis in Chapter 4, local rates, on a nationwide rural basis, would increase by $12.84 per month. It appears from the regression analysis of consumer choices that income would be the primary deciding factor in determining what action or actions subscribers would choose if rates were to increase to that level. This relates the $15 local rate increase to the $12.84 outcome because that is the closest level that respondents had available to choose.[18]

One proposal currently under consideration in federal and state arenas is targeting support to low-income subscribers as an alternative to today's system of cost support mechanisms for LECs. (See Chapter 4 for an explanation of the current cost support mechanisms.) As the foregoing analysis indicates, although income appears to play a very significant role in the response to price increases, simply targeting income would not eliminate the adverse effect of rate increases and would not, by itself, preserve **universal service** if rates were to increase significantly. From the regression analysis, the ability of income to predict subscribers' choices is very modest.

In addition, analysis of the OPASTCO Subscriber Survey data shows that younger households indicate a tendency to disconnect at a $25 per month increase, which suggests that current **Lifeline** programs, with their age restrictions, may exclude a segment of the population in need of this program.

Long Distance Rate Increases

The responses indicating subscribers would disconnect their local service due to an increase in long distance rates suggest that more analysis in this area is warranted. It is known, however, that subscribers typically consider their responses on the basis of their total bill.

Subscriber reactions to increases in long distance rates also were examined based on lifestyle category and age. Empty nesters are most likely to disconnect service because of a $5 toll increase, while starting-out singles are most likely to disconnect at a $25 increase. At a $5 increase, mature singles are most likely to simply pay the increase, while young couples without children are second most

[18]Consumers, however, typically consider their responses on the basis of their total bill, which, according to the analysis in Chapter 4, would increase by $31.37 per month if toll rates also were deaveraged. In this case, $25 would be the level most significant to subscribers. At this level, household size impacts decisions about what other expenditures would be adjusted to offset such a rate increase if respondents do not indicate that they would disconnect service.

likely to simply pay. Empty nesters are most likely to make long distance calls only during times when discounts are in effect at $15 and $25 increases, while mature singles are most likely to reduce both the number and length of their toll calls at these price increase levels.

Unlike lifestyle category, age is a significant predictor of perceived behavior at all rate increase levels. Subscribers age 55 and older are less likely to just pay a $5 increase and more likely to reduce long distance calling and shift calling to off-peak hours. Those ages 19 to 24 are the most likely to disconnect service at a $5 increase. The 25 to 34 age group and the 35 to 44 age group are most likely to decrease the number of long distance calls at $10 and $15 increases, while the 19 to 24 age group shows a tendency to be more likely to reduce both the number and length of calls at a $15 increase. Those ages 55 to 64 are most likely to disconnect service at a $25 increase.[19]

When age and income are subjected to regression analysis on the various options subscribers have when faced with toll rate increases, age is strongly linked to reductions in toll calls, and off-peak calling at a $5 increase level. While older groups are most likely to report that they would reduce calls and increase off-peak use, it is the younger age groups that report reduced call length. At this level, income is a significant factor in subscribers' indicating that they would reduce spending in several areas to compensate for toll rate increases.

At $10 and $25 toll rate increases, only income appears to be a significant factor, while at $15, income is a significant factor in all areas except for reduction in overall long distance use, where age appears as the determinant. Again, the type of regression and the resulting tables are outlined in Appendix D. (Lifestyle category was dropped from the analysis because of its collinearity with age.)

Telephone Service in Rural Life

The impact on rural America of eliminating cost support mechanisms cannot be measured only in terms of how many people would disconnect or reduce their telephone service. Policy-makers also must consider the importance of the telephone in rural residents' everyday lives and the negative consequences that families and communities would suffer if they no longer could afford to rely on their central means of communication—the telephone.

The remainder of Chapter 5 describes how rural residents currently depend on the telephone as a vital link to services, personal relationships, and community life.

Defining Rural Residents

Rural consumers have been hard hit by the changing U.S. economy. Traditional rural industries, such as mining, agriculture, and manufacturing, are declining and will continue to do so for the foreseeable future. The lower wages associated with many occupations in rural America, combined with a higher incidence of unemployment and under-employment, make affordable telephone service a critical issue.

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[19]However, this changes rather markedly if missing responses are treated above the line; those ages 35 to 44 would then show the greatest propensity to disconnect at a $25 increase.

Figure 5.9

Demographic Characteristics of the OPASTCO Subscriber Survey Respondents

Table 1
Age

Response	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Age 18 and under	4	0.2%	4	0.2%
Ages 19 to 24	21	1.2%	25	1.4%
Ages 25 to 34	193	10.7%	218	12.1%
Ages 35 to 44	372	20.6%	590	32.7%
Ages 45 to 54	356	19.7%	946	52.4%
Ages 55 to 64	312	17.3%	1,258	69.7%
Age 65 and over	549	30.4%	1,807	100.1%

Frequency Missing = 65

Table 2
Gender

Response	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Male	813	48.8%	813	48.8%
Female	818	49.1%	1,631	98.0%
Both together	34	2.0%	1,665	99.9%

Frequency Missing = 207

Table 3
Annual Household Income

Response	Frequency	Percentage	Cumulative Frequency	Cumulative Percentage
Under $5,000	48	3.5%	48	3.5%
$5,000 to $7,499	61	4.4%	109	7.9%
$7,500 to $9,999	55	4.0%	164	11.9%
$10,000 to $12,499	63	4.6%	227	16.5%
$12,500 to $14,999	70	5.1%	297	21.6%
$15,000 to $17,499	73	5.3%	370	26.9%
$17,500 to $19,999	63	4.6%	433	31.5%
$20,000 to $24,999	132	9.6%	565	41.1%
$25,000 to $29,999	117	8.5%	682	49.6%
$30,000 to $34,999	155	11.2%	837	60.8%
$35,000 to $39,999	126	9.1%	963	69.9%
$40,000 to $49,999	157	11.4%	1,120	81.3%
$50,000 to $74,999	178	12.9%	1,298	94.2%
$75,000 and over	80	5.8%	1,378	100.0%

Frequency Missing = 494

(continued)